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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/809,926	03/26/2004	Osamu Kawachi	025720-00028	6762

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EXAMINER

SUMMONS, BARBARA

ART UNIT PAPER NUMBER

2817

DATE MAILED: 08/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/809,926	<b>Applicant(s)</b> KAWACHI ET AL.	
	<b>Examiner</b> Barbara Summons	<b>Art Unit</b> 2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-10 and 12-16 is/are rejected.
- 7) ☒ Claim(s) 3,11 and 17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>3/26/04 &amp; 7/21/05</u> | 6) <input type="checkbox"/> Other: ____  |

## DETAILED ACTION

### *Specification*

1. The disclosure is objected to because of the following informalities: On page 7, on line 24, it appears that "meal" should correctly be - - metal - -.

Appropriate correction is required.

### *Claim Objections*

2. Claim 13 is objected to because of the following informalities:

In claim 13, on line 5, note that "surround" should be - - surrounded - -.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

3. The following is a quotation of the second paragraph of 35 U.S.C. § 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 16 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 16 recites the limitation "the second pads" on line 3 thereof. There is insufficient antecedent basis for this limitation in the claim.

### *Claim Rejections - 35 USC § 102*

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 2817

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1, 2, 4, 10, 12-14 and 16 are rejected under 35 U.S.C. §§ 102(a) and 102(e) as being anticipated by Enshasy U.S. 2003/0080832.

Regarding the claimed feature "surface activation process", it should be noted that the specification is not considered to have provided a special definition for this terminology, and so the Examiner will give it its broadest possible interpretation. Additionally, regarding apparatus claim 1, "joined by a surface activation process" is given very little patentable weight since this is considered to be a product-by-process claim in which it is the finished product that determines patentability. That is, "the patentability of a product does not depend on its method of production" *In re Thorpe*, USPQ 964,966 (Fed. Cir. 1985) (citations omitted). [See also MPEP § 2113]. These positions are maintained, though not repeated, in all rejections in this Office action.

Fig. 6 of Enshasy discloses a surface acoustic wave (SAW) device and an associated method of making the device, comprising: a piezoelectric substrate 12 having a first surface on which comb-electrodes are formed in the active region 14 (see also Figs. 1-3 and section [0012]), first pads 16 are inherently connected thereto (*ibid.*),

Art Unit: 2817

and a first film 10 (Fig. 2) that is provided at the periphery of the piezoelectric substrate and surrounds the comb-electrodes and first pads; and a base substrate 22 having a second surface on which second pads 28 (Fig. 5) joined to the first pads by bumps 20, and a second film 36 joined to the first film 10 and corresponding to the position of the first film are provided; and wherein the first and second films are subjected to a "surface activation process" of heating which is considered to "activate" the surfaces by partially melting the gold solder layer 18 surface of the first film (see Fig. 3 and section [0013]) and the solder layer 42 surface of the second film 36 to join the activated surfaces of the first and second films to hermetically seal the SAW device in a cavity defined by the first and second films (see also sections [0014]-[0015]).

Regarding claims 4, 10 and 16, base substrate 22 is ceramic or another insulator (see section [0014]), and via wiring lines 26 are formed through the base substrate 22 connected to the second pads 28 so that the first pads 16 can be electrically connected to pads 32 on an opposite surface of the base substrate 22 from the second surface.

7. Claims 1, 2, 4, 10, 12-14 and 16 are rejected under 35 U.S.C. § 102(b) as being anticipated by Kong et al. EP 0 609 062.

Fig. 6 of Kong et al. discloses a SAW device 31 comprising: a piezoelectric substrate 11 with a first surface on which comb-electrodes, first pads 23 (see Fig. 2) and a first film 17 surrounding the electrodes and first pads are formed; a base insulator substrate 15 (see also Fig. 3) having a second surface on which second pads (not labeled) joined to the first pads, and a second film 17 (Fig. 3) correspondingly

Art Unit: 2817

positioned and joined to the first film, are formed; and wherein the first and second films are subjected to a "surface activation process" of heating which is considered to "activate" the surfaces by partially melting the gold solder layer 17/33 (Figs. 2/6) and the indium solder layer 17/35 (Figs. 3/6) to join the activated surfaces of the first and second films to hermetically seal the SAW device in a cavity defined by the first and second films; and via wiring lines 19 electrically connecting the first and second pads to the surface of the base substrate 15 that is opposite the second surface.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 6-9 and 15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over either one of Enshasy U.S. 2003/0080832 or Kong et al. EP 0 609 062 in view of Ohashi et al. JP 2000-68785.

Art Unit: 2817

Each of Enshasy and Kong et al. discloses the invention as discussed above.

However, they do not disclose an electric element/impedance matching circuit formed on the second surface of the base substrate or the SAW device including a transmit filter and a receive filter.

Ohashi et al. discloses that it would have been extremely well known in the SAW device art to provide a SAW branching filter (Figs. 2 and 3) with transmit and receive filters on the same piezoelectric substrate (see Fig. 4) and an impedance matching circuit 102 formed on the base substrate of a package.

Consequently, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the SAW devices of either Enshasy or Kong et al. by having provided the SAW device as a branching filter with a transmit and a receive filter and an impedance matching circuit on the base substrate, in view of the exemplary teaching thereof by Ohashi et al. thereby suggesting that such a modification would have been merely an obvious intended use of the packaged SAW devices of Enshasy or Kong et al., and because Enshasy and Kong et al. are each silent as to the exact configuration of their SAW devices, thereby suggesting to one of ordinary skill in the art that any configuration such as the notoriously well known branching filter configuration suggested by Ohashi et al., would have been usable therewith.

Furthermore, Kong et al. explicitly suggests a SAW device that can be SAW band pass filters (see col. 2, lines 10-14) wherein a branching filter is merely two filters and would have been one of the SAW devices well known by one of ordinary skill in the art (ibid.).

Art Unit: 2817

10. Claim 5 is rejected under 35 U.S.C. § 103(a) as being unpatentable over either one of Enshasy U.S. 2003/0080832 or Kong et al. EP 0 609 062 in view of Goetz et al. U.S. 6,621,379.

Each of Enshasy and Kong et al. discloses the invention as discussed above.

However, Enshasy and Kong et al. each disclose a ceramic base substrate rather than a silicon base substrate.

Goetz et al. discloses a similar package structure and discloses that the base substrate can be either ceramic or silicon (see e.g. col. 5, lines 8-12).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the SAW device of either Enshasy or Kong et al. by having used a silicon base substrate in place of the ceramic base substrates thereof, because such an obvious modification would have been merely the substitution of art recognized alternative base substrates as explicitly suggested by Goetz et al. (ibid.).

#### ***Allowable Subject Matter***

11. Claims 3, 11 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Conclusion***

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.



Art Unit: 2817

Enquist et al. U.S. 6,822,326 discloses hermetically packaging MEMs (micro-electro-mechanical) devices by using a "surface activation" process (see Fig. 4 and col. 16, lines 29-33).

Takagi et al. "Wafer-Scale Room-Temperature Bonding Between Silicon And Ceramic Wafers By Means of Argon-Beam Surface Activation" discloses bonding by surface activation of silicon and piezoelectric ceramics (see Figs. 4 and 8).

Lakin et al. U.S. 6,114,635 discloses a package for acoustic wave devices including a piezoelectric substrate 1 (Figs. 1 and 3B) and a base substrate 6 with via holes, each substrate with respective films 5 and 8 connected by bonding material 9.

Wright U.S. 6,445,265 discloses molecular bonding of a piezoelectric substrate to a carrier substrate of silicon (see col. 3, lines 13-20) or sapphire (see col. 4, lines 53-55), and provides additional evidence that it is known to form an electrical circuit 19 (see Fig. 8c) on a base/cover substrate 482.

Cohn et al. U.S. 6,853,067 discloses a MEMs device package that includes acoustic wave devices (see col. 10, lines 31-32) with the acoustic device formed on a substrate wafer 300 (see Figs. 3a and 3b) and a cover/base substrate wafer 350 having electric circuits 318, and joining the two substrates by heat and pressure (Fig. 4).

Sato et al. U.S. 5,847,489 discloses a similar SAW device (Fig. 22), wherein the piezoelectric substrate 2601 and the base/cover substrate 2602 are direct bonded by ionic material covered portions 2605 (see col. 16, lines 18-25).

Yuhara et al. JP 5-235688 provides additional evidence of providing matching circuits in the package of a SAW branching filter device (see Figs. 1 and 2).

Art Unit: 2817

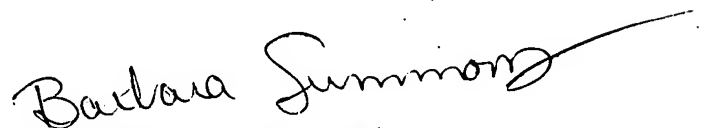
Egara et al. JP 8-330894 discloses a SAW device piezoelectric substrate 11 and a base/cover substrate 30 with via holes 40 connected by being "subjected to anode junction" at periphery 20 (see the abstract the last four lines thereof).

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barbara Summons whose telephone number is (571) 272-1771. The examiner can normally be reached on M-Th, M-Fr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bob Pascal can be reached on (571) 271-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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August 3, 2005



**BARBARA SUMMONS  
PRIMARY EXAMINER**